IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Canceled)

2. (Canceled)

3. (Canceled)

4. (Canceled)

5. (Canceled)

6. (Canceled)

7. (Original) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

a signal processor for applying a detection process and a logarithmic transformation process to the ultrasonic echo;

an image generator for generating an ultrasonic image based on an output of the signal processor;

an antilogarithmic transformation unit for applying an antilogarithmic transformation process to an output signal coming from at least either of the signal processor or the image generator; and

a processor for plotting a time-varying graph based on the output signal coming from the antilogarithmic transformation unit.

8. (Original) The ultrasonic diagnostic apparatus according to claim 7, wherein

the measurement processor derives a mean transit time of a blood flow based on the time-varying graph.

9. (Currently Amended) The ultrasonic diagnostic apparatus according to claim 7, wherein

the control unit controls the driving signal generator in such a manner that an initial scanning is performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and

based on a result of the initial scanning, the measurement processor ~~standardizes~~ normalizes a value of the scanning performed after the initial scanning to plot the graph.

10. (Original) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

a signal generator for generating a first signal as a result of a detection process and a logarithmic transformation process applied with respect to the ultrasonic echo, and a second signal as a result of the detection process applied with respect to the ultrasonic echo;

an image generator for generating an ultrasonic image based on the first signal; and

a measurement processor for plotting the time-varying graph based on the second signal.

11. (Original) The ultrasonic diagnostic apparatus according to claim 10, wherein the measurement processor derives a mean transit time of a blood flow based on the time-varying graph.

12. (Currently Amended) The ultrasonic diagnostic apparatus according to claim 10, wherein

based on a result of the scanning performed for an initial time after a lapse of time in which the contrast agent is fully filled in a target part of the subject, the measurement processor ~~standardizes~~ normalizes a value of the scanning performed after the initial scanning to plot the graph.

13. (Original) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for deriving a time-varying concentration of the contrast agent;

an image generator for generating an ultrasonic image based on the ultrasonic echo; and

a measurement processor for plotting a time-varying concentration graph of the contrast agent based on the ultrasonic echo, and for compensating a mean transit time of a blood flow derived from the time-varying graph depending on a measurement position depth.

14. (Currently Amended) The ultrasonic diagnostic apparatus according to claim 13, wherein

the control unit controls the driving signal generator in such a manner that an initial scanning is performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and based on a result of the initial scanning, the measurement processor ~~standardizes~~ normalizes a value of the scanning performed after the initial scanning to plot the graph.

15. (Original) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe for transmitting ultrasound to a subject having been injected with a contrast agent, and receiving ultrasonic echo from the subject;

a driving signal generator for generating a driving signal for driving the ultrasonic probe;

a control unit for controlling the driving signal generator based on a predetermined scan sequence for plotting a time-varying concentration graph of the contrast agent;

an image generator for generating an ultrasonic image based on the ultrasonic echo; and

a measurement processor for plotting the time-varying concentration graph of the contrast agent based on the ultrasonic echo, and for compensating the time-varying graph depending on a measurement position depth.

16. (Currently Amended) The ultrasonic diagnostic apparatus according to claim 15, wherein

the control unit controls the driving signal generator in such a manner that an initial scanning is performed after a lapse of time in which the contrast agent is fully filled in a target part of the subject, and based on a result of the initial scanning, the measurement processor ~~standardizes~~ normalizes a value of the scanning performed after the initial scanning to plot the graph.

17. (New) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe which applies ultrasound to an applied region of a subject having been injected with a contrast agent, and receives an ultrasonic echo from the applied region;

a driving signal generator which generates a driving signal to drive the ultrasonic probe:

a control unit which controls the driving signal generator on the basis of a scan sequence, the scan sequence performing a first scanning with an ultrasound of such a high intensity that the contrast agent is collapsed, after a time at which the contrast agent is saturated in the applied region, and performing a second scanning a plurality of times at time-varying time intervals after the first scanning, with the ultrasound of such a high intensity that the contrast agent is collapsed; and

a processor which plots a time-varying graph of concentration of the contrast agent based on intensity of the ultrasonic echo under the saturation state of the contrast agent obtained by the first scanning and intensity of the ultrasonic echo at a rising point of the time-varying graph obtained by the second scanning.

18. (New) The ultrasonic diagnostic apparatus according to claim 17, wherein each of the time intervals at which the second scanning is performed a plurality of times is half or less than half the time at which the contrast agent is saturated in the applied region.

19. (New) The ultrasonic diagnostic apparatus according to claim 17, wherein the processor acquires a mean transit time of a blood flow based on the time-varying graph.

20. (New) The ultrasonic diagnostic apparatus according to claim 17, wherein each of the time intervals at which the second scanning is performed a plurality of times is half or less than half a period from a time based on a latest scanning with an ultrasound of such a high intensity that the contrast agent is collapsed to a time at which the contrast agent is saturated in the applied region.

21. (New) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe which applies ultrasound to a hepatic region of a subject having been injected with a contrast agent, and receives an ultrasonic echo from the hepatic region;

a driving signal generator which generates a driving signal to drive the ultrasonic probe:

a control unit which controls the driving signal generator on the basis of a scan sequence, the scan sequence performing a first scanning with an ultrasound of such a high intensity that the contrast agent is collapsed, after a time at which the contrast agent is saturated in the applied region, and performing a second scanning a plurality of times at time-varying time intervals set to be 3 seconds or shorter, after the first scanning, with an ultrasound of such a high intensity that the contrast agent is collapsed; and

a processor which plots a time-varying graph of concentration of the contrast agent based on intensity of the ultrasonic echo under the saturation state of the contrast agent obtained by the first scanning and intensity of the ultrasonic echo at a rising point of the time-varying graph obtained by the second scanning.

22. (New) The ultrasonic diagnostic apparatus according to claim 21, wherein each of the time intervals at which the second scanning is performed a plurality of times is half or less than half the time at which the contrast agent is saturated in the applied region.

23. (New) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe which applies ultrasound to an applied region of a subject having been injected with a contrast agent, and receives an ultrasonic echo from the applied region;

a driving signal generator which generates a driving signal to drive the ultrasonic probe:

a control unit which controls the driving signal generator on the basis of a scan sequence, the scan sequence performing a first scanning with an ultrasound of such a high intensity that the contrast agent is collapsed, after a time at which the contrast agent is saturated in the applied region, and performing a second scanning a plurality of times at time-varying time intervals after the first scanning, with the ultrasound of such a high intensity that the contrast agent is collapsed; and

a processor which plots a time-varying graph of concentration of the contrast agent, which is approximated linearly, based on intensity of the ultrasonic echo under the saturation state of the contrast agent obtained by the first scanning and intensity of the ultrasonic echo at a rising point of the time-varying graph obtained by the second scanning.

24. (New) The ultrasonic diagnostic apparatus according to claim 23, wherein each of the time intervals at which the second scanning is performed a plurality of times is half or less than half the time at which the contrast agent is saturated in the applied region.

25. (New) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe which applies ultrasound to an applied region of a subject having been injected with a contrast agent, and receives an ultrasonic echo from the applied region;

a driving signal generator which generates a driving signal to drive the ultrasonic probe:

a control unit which controls the driving signal generator on the basis of a scan sequence, the scan sequence performing a first scanning with an ultrasound of such a high intensity that the contrast agent is collapsed, after a time at which the contrast agent is saturated in the applied region, and performing a second scanning a plurality of times at time-varying time intervals after the first scanning such that a plurality of scanning operations are performed each time, with the ultrasound of such a high intensity that the contrast agent is collapsed; and

a processor which plots a time-varying graph of concentration of the contrast agent based on intensity of the ultrasonic echo under the saturation state of the contrast agent obtained by the first scanning and intensity of the ultrasonic echo at a rising point of the time-varying graph obtained by the second scanning.

26. (New) The ultrasonic diagnostic apparatus according to claim 25, wherein each of the time intervals at which the second scanning is performed a plurality of times is half or less than half the time at which the contrast agent is saturated in the applied region.

27. (New) The ultrasonic diagnostic apparatus according to claim 25, wherein the processor plots the time-varying graph of the concentration of the contrast agent by using a mean value of the ultrasonic echo obtained by said plurality of second scannings at each of the time intervals.

28. (New) An ultrasonic diagnostic apparatus, comprising:

an ultrasonic probe which applies ultrasound to an applied region of a subject having been injected with a contrast agent, and receives an ultrasonic echo from the applied region;

a driving signal generator which generates a driving signal to drive the ultrasonic probe:

a control unit which controls the driving signal generator on the basis of a scan sequence, the scan sequence performing a first scanning with an ultrasound of such a high intensity that the contrast agent is collapsed, after a time at which the contrast agent is saturated in the applied region, and performing a second scanning a plurality of times at time-varying time intervals after the first scanning, with the ultrasound of such a high intensity that the contrast agent is collapsed; and

a processor which plots a time-varying graph of concentration of the contrast agent, which is normalized by the saturation value of the contrast agent in the applied region, based on intensity of the ultrasonic echo under the saturation state of the contrast agent obtained by the first scanning and intensity of the ultrasonic echo at a rising point of the time-varying graph obtained by the second scanning.

29. (New) The ultrasonic diagnostic apparatus according to claim 29, wherein each of the time intervals at which the second scanning is performed a plurality of times is half or less than half the a time at which the contrast agent is saturated in the applied region.